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I HEREBY CERTIFY THAT THIS IS A TRUE AND CORRECT
COPY OF ONE OF THE CONTRACT DRAWINGS FOR
STRUCTURAL PART OF CONTRACT NO. WTC-945.071
IN THE FORM IN WHICH SAID DRAWING EXISTED AT
THE TIME THE SAID CONTRACT WAS EXECUTED BY THE
PARTIES.
DATE 11/17/97 *Leslee E. Robertson*
DATE 11/17/97 *PK*
SIGNATURE OF OWNER
SIGNATURE OF ENGINEER

11/17/97 ISSUED FOR BID

No. Date Revision Approved
Engineering Department
Design Divisions

The World
Trade
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STANDBY POWER
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STRUCTURAL

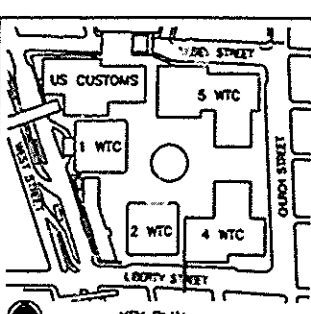
GENERAL NOTES

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Date 11/17/97 Scale

Contract Number WTC-945.071 Drawing Number SO-03



1. QUALITY ASSURANCE

1. ASTM A325 AND A490 BOLTS, NUTS AND WASHERS SHALL BE TESTED BY CONTRACTOR. EACH TESTING SHALL BE IN ADDITION TO TESTING REQUIRED BY MANUFACTURER IN PART 111.10 OF THIS SPECIFICATION. SAMPLING, INSPECTIONS AND TESTING SHALL BE BY THE SHIPPING LOT METHOD, TAKEN FROM FASTENER COMPONENTS ACTUALLY DELIVERED TO THE CONSTRUCTION SITE.

- a) CHEMICAL ANALYSIS (A751) IS NOT REQUIRED. PROOF LOAD TESTING (F606) SHALL BE ACCOMPLISHED FOR EACH LOT OF EACH GRADE, SIZE AND TYPE OF EACH FASTENER COMPONENT.
- b) PROOF LOAD TESTING SHALL BE CONDUCTED ON FULL-SIZE BOLTS AND COMPONENTS. NOT ON MACHINED TEST SPECIMENS.
- c) PROOF LOAD TESTING SHALL BE ACCOMPLISHED USING METHOD 1 (LENGTH MEASUREMENT) OF METHOD F606.
- d) TESTING SHALL INCLUDE BOTH HARDNESS AND TENSILE STRENGTH.
- e) ADDITIONALLY, PROVIDE ALL OTHER TESTING STIPULATED AS MANDATORY UNDER THE ASTM SPECIFICATION.

2. BOLT INSTALLATION SHALL BE IN ACCORD WITH THE PROVISIONS OF THIS SPECIFICATION AND IN NO CASE LESS THAN THE BEST INDUSTRY PRACTICE.

a) CONTRACTOR SHALL PROVIDE AND SHALL MAINTAIN IN GOOD CONDITION A SKIDMORE WELSH BOLT TENSION CALIBRATOR (OR OTHER DEVICE ACCEPTED BY THE ENGINEER) AT EACH LOCATION WHERE HIGH-STRENGTH BOLTS ARE BEING TENSIONED. CONTRACTOR SHALL TEST REGULARLY.

- 1) BOLT, NUT, WASHER AND LUBRICANT ASSEMBLIES FOR THE ACHIEVEMENT OF PROPER TENSION; AND
- 11) THE COMPETENCE AND UNDERSTANDING OF BOLTING CREWS FOR EACH METHOD OF TENSIONING BOLTS FOR EACH SIZE AND GRADE EMPLOYED IN THE WORK.

J. JOB CONDITIONS

1. CONSTRUCTION SEQUENCE: DESCRIPTIONS OF LIMITATIONS ON CONSTRUCTION SEQUENCE ARE INTENDED TO ASSIST CONTRACTOR IN COORDINATING THE WORK OF THE CONTRACT. DESCRIPTIONS DO NOT DESCRIBE FULLY THE LIMITATIONS GIVEN, DO NOT DESCRIBE ALL LIMITATIONS, NOR DO THEY PRECLUDE CONSTRUCTION SEQUENCES NOT CONTAINED HEREIN. WHETHER OR NOT CONTRACTOR FOLLOWS THE LIMITATIONS ON CONSTRUCTION SEQUENCE DESCRIBED HEREIN, AND UNTIL SUCH TIME AS THE STRUCTURAL WORK IS COMPLETED, CONTRACTOR REMAINS FULLY RESPONSIBLE FOR BOTH THE STABILITY AND THE SAFETY OF THE WORK. ADDITIONALLY, TO THE LIMITATIONS DESCRIBED HEREIN DOES NOT RELIEVE CONTRACTOR FROM THAT RESPONSIBILITY.

K. MATERIALS

1. STRUCTURAL STEEL FURNISHED FOR EACH LOCATION SHALL PROVIDE THE MINIMUM YIELD POINT GIVEN IN THE CONTRACT DRAWINGS, SHALL CONFORM TO THE APPLICABLE ASTM STEEL SPECIFICATION, SHALL MEET THE REQUIREMENTS OF BUILDING CODE, SHALL BE SUITABLE FOR USE IN WELDED STRUCTURES AND SHALL MEET THE REQUIREMENTS BOTH OF THE CONTRACT DRAWINGS AND OF THIS SPECIFICATION. ALL MATERIAL SHALL BE NEW AND OF BEST COMMERCIAL QUALITY. STEELS PROCURED TO MODIFIED ASTM SPECIFICATIONS SHALL NOT BE USED WITHOUT WRITTEN ACCEPTANCE. EXCEPT WHERE SPECIFIC PRODUCTS ARE GIVEN IN THE CONTRACT DRAWINGS OR IN THIS SPECIFICATION, STRUCTURAL STEEL USED IN THE WORK MAY BE CHOSEN BY CONTRACTOR FROM THE APPLICABLE SPECIFICATIONS LISTED IN AISC SPECIFICATION AND ACCEPTED BY BOTH BUILDING CODE AND BY THE ENGINEER.

2. CONTRACTOR, IN ORDERING MATERIALS FROM MANUFACTURERS AND VENDORS, SHALL ENSURE THAT THE MANUFACTURER OR VENDOR UNDERSTANDS FULLY THE INTENDED USE OF THE AS-FABRICATED AND AS-ERECTED WORK. PURCHASE ORDERS SHALL IDENTIFY THE END USE OF PURCHASED MATERIALS. EXAMPLES OF END USE INCLUDE:

- a) TRUSS CORGOS AND WEB MEMBERS
- b) BUILT-UP MEMBER FLANGES AND WEBS
- c) COLUMNS
- d) TENSION MEMBERS
- e) ELEMENTS OF RIGID FRAMES
- f) ALL ELEMENTS IDENTIFIED SPECIFICALLY IN DRAWINGS
- g) ALL SPECIAL AND SENSITIVE AREAS OF THE WORK

PARTICULAR CARE SHALL BE TAKEN TO IDENTIFY MATERIALS:

- a) STRESSED IN TENSION TRANSVERSE TO THE GRAIN (RIGID FRAMES, TRUSSES, ETC.)

IT IS THE INTENT OF THESE PROVISIONS TO ASSIST PRODUCER IN THE SELECTION OF MATERIALS BEST SUITED FOR THE INTENDED PURPOSE.

3. UNLESS NOTED SPECIFICALLY AS NOT CARRYING TENSILE LOADS OR DETAILLED AS BOLTED, ALL STEELS AND PRODUCTS SELECTED FOR USE IN THE WORK SHALL BE SUITABLE FOR USE AS TENSION MEMBERS, CONNECTED BY WELDING.

4. SHOP AND FIELD-APPLIED PAINT SHALL BE PROVIDED WHERE DESIGNATED IN THE CONTRACT DRAWINGS. SPECIFIED HEREIN, AND WHERE REQUIRED BY BUILDING CODE, PAINT MATERIALS SHALL BE FULLY COMPATIBLE WITH FIREPROOFING AND OTHER MATERIALS IN CONTACT WITH THE PAINT AND SHALL BE SELECTED FROM THE FOLLOWING:

- a) SHOP PRIMER AND FIELD TOUCH-UP:
 - 1) TIDEX 10-59, TIDEX CO., INC.
 - 11) CARBOLINE GP-818, CARBOLINE INC.
 - 111) DUPONT 631-FD, RED OXIDE, DUPONT CO.
 - 1V) OTHER WHERE ACCEPTED

- b) ZINC-RICH:
 - 1) TIDEX 92-94, TIDEX CO., INC.
 - 11) CARBOLINE CARBOLINE 11 HS, CARBOLINE INC.
 - 111) GARDOLIN 347 MS, DUPONT CO.
 - 1V) OTHER CLASS A OR BETTER COATING, AS DEFINED BY AISC, WHERE ACCEPTED

c) ALUMINUM PASTE VARNISH SHALL CONSIST OF 2 LBS OF ALUMINUM PASTE PIGMENT (ASTM D 951-86, TYPE 2, CLASS B) PER GALLON (128 OZ PER LITER) OF ALKYL VARNISH (FEDERAL SPECIFICATION TYP-V-8, TYPE 11).

5. GALVANIZED STEEL: WHERE REQUIRED TO BE GALVANIZED, MEMBER SHALL BE HOT-DIPPED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 OR ASTM A123 (TABLE 1), AS APPLICABLE. GALVANIZING SHALL EQUAL OR EXCEED 2 OZ. PER SQUARE FOOT (600 G/M²) OF SURFACE.

6. GALVANIZING TOUCH-UP: PROVIDE ORGANIC, ZINC-RICH PAINT:

- a) TIDEX 92-97
- b) CARBOLINE 858, CARBOLINE INC.
- c) FPO INDUSTRIES NO. 97-670, FPO INDUSTRIES
- d) OTHER WHERE ACCEPTED

7. WELDING MATERIALS SHALL BE AS REQUIRED BY AWS FOR THE CONDITIONS OF INTENDED USE AND FOR THE METAL BEING WELDED. WELDING MATERIALS SHALL CONFORM TO AWS A5.1, A5.5, A5.17, A5.18, A5.20 AND A5.23 AND SHALL BE E7018, E7018-C1, E7018-C2, E7018-C3, E7018-C4, E7018-C5, E7018-C6, E7018-C7, E7018-C8, E7018-C9, E7018-C10, E7018-C11, E7018-C12, E7018-C13, E7018-C14, E7018-C15, E7018-C16, E7018-C17, E7018-C18, E7018-C19, E7018-C20, E7018-C21, E7018-C22, E7018-C23, E7018-C24, E7018-C25, E7018-C26, E7018-C27, E7018-C28, E7018-C29, E7018-C30, E7018-C31, E7018-C32, E7018-C33, E7018-C34, E7018-C35, E7018-C36, E7018-C37, E7018-C38, E7018-C39, E7018-C40, E7018-C41, E7018-C42, E7018-C43, E7018-C44, E7018-C45, E7018-C46, E7018-C47, E7018-C48, E7018-C49, E7018-C50, E7018-C51, E7018-C52, E7018-C53, E7018-C54, E7018-C55, E7018-C56, E7018-C57, E7018-C58, E7018-C59, E7018-C60, E7018-C61, E7018-C62, E7018-C63, E7018-C64, E7018-C65, E7018-C66, E7018-C67, E7018-C68, E7018-C69, E7018-C70, E7018-C71, E7018-C72, E7018-C73, E7018-C74, E7018-C75, E7018-C76, E7018-C77, E7018-C78, E7018-C79, E7018-C80, E7018-C81, E7018-C82, E7018-C83, E7018-C84, E7018-C85, E7018-C86, E7018-C87, E7018-C88, E7018-C89, E7018-C90, E7018-C91, E7018-C92, E7018-C93, E7018-C94, E7018-C95, E7018-C96, E7018-C97, E7018-C98, E7018-C99, E7018-C100.

8. SHIELDING GAS SHALL BE OF A WELDING GRADE HAVING A Dew Point of -40°F (-40°C) OR LOWER.

9. STUD SHEAR CONNECTORS AND CONCRETE ANCHOR STUDS: MATERIAL AND EQUIPMENT FOR WELDED STUDS, STUD SHEAR CONNECTORS AND CONCRETE ANCHOR STUDS SHALL CONFORM TO AWS D1.1.

10. HIGH TENSILE BOLTS, NUTS AND WASHERS SHALL CONFORM TO THE APPLICABLE ASTM SPECIFICATION AS FOLLOWS:

- BOLTS: ASTM A325, TYPE 1 OR ASTM A490, TYPE 1
- NUTS: ASTM A325, TYPE 1 OR ASTM A490, TYPE 1
- WASHERS: ASTM A325, TYPE 1 OR ASTM A490, TYPE 1

ALL FASTENER COMPONENTS SHALL BEAR THE MANUFACTURER'S MARK. NUTS SHALL BEAR THE IN OR 2H SYMBOL AS APPLICABLE. ALL BOLTS, NUTS AND WASHERS SHALL BE COLD FORGED; BOLTS AND NUTS SHALL HAVE ROLLED THREADS. NEITHER HOT FORGED BOLTS OR NUTS NOR CUT THREADS MAY BE USED IN THE WORK.

a) IN ADDITION TO THE MANDATORY TESTING PROVIDED IN THE ASTM SPECIFICATION, PROOF LOAD TESTING (F606), CHEMICAL ANALYSIS (A751) AND CERTIFICATION SHALL BE REQUIRED OF MANUFACTURER FOR GALVANIZED BOLTS, NUTS AND WASHERS. MANUFACTURER'S CERTIFICATION SHALL INCLUDE THE RESULTS OF THE ROTATIONAL-CAPACITY TESTS AS WELL AS THE RESULTS OF THE ZINC THICKNESS MEASUREMENTS. EXCEPT FOR THE ROTATIONAL-CAPACITY TESTS OF GALVANIZED BOLT, NUT AND WASHER ASSEMBLIES, WHICH SHALL BE PERFORMED IN ACCORD WITH THE SHIPPING LOT METHOD, ALL TESTING AND ANALYSIS SHALL BE CONDUCTED IN ACCORD WITH THE PRODUCTION LOT METHOD. TESTING SHALL BE COMPLETED FOR EACH GRADE OF EACH TYPE OF EACH SIZE OF FASTENER. FASTENER COMPONENTS NOT IN FULL CONFORMANCE TO THE APPROPRIATE ASTM SPECIFICATION SHALL NOT BE SHIPPED TO THE WORK.

- 1) PROOF LOAD TESTING SHALL BE CONDUCTED ON FULL-SIZE BOLTS AND COMPONENTS NOT ON MACHINED TEST SPECIMENS.
- 11) PROOF LOAD TESTING SHALL BE ACCOMPLISHED USING METHOD 1 (LENGTH MEASUREMENT) OF METHOD F606.
- 111) TESTING SHALL INCLUDE BOTH HARDNESS AND TENSILE STRENGTH.

b) BOLTS, NUTS AND WASHERS SHALL BE MANUFACTURED BY A MEMBER OF THE INDUSTRIAL FASTENERS INSTITUTE AND SHALL BE PURCHASED DIRECTLY FROM THE MANUFACTURER AND NOT FROM A SECONDARY SOURCE.

c) ACCEPTED MANUFACTURERS ARE:

- 1) LAKE ERIE SCREW CORP.
- 2) MUXOR FASTENER
- 3) OTHER WHERE ACCEPTED.

d) DOUBLE NUTS SHALL BE USED FOR ALL FASTENERS DESIGNATED AS FINGER TIGHT.

e) GALVANIZED BOLTS, NUTS, WASHERS, DTY'S AND INSERTS, AS APPLICABLE, CONFORMING TO ASTM B695, CLASS 50 SHALL BE USED AT ALL SURFACES CONTAINING GALVANIZED MATERIALS AND AT ALL SURFACES AND TECHNIQUES IN ACCORD WITH WRITTEN PROCEDURE DOCUMENTS AND APPLICABLE DETAIL SKETCHES PREPARED BY THE FABRICATOR AND ACCEPTED BY ENGINEER.

f) BEVELED WASHERS SHALL BE SQUARE, SMOOTH, AND SHALL BE SLOPED TO PROVIDE CONTACT SURFACES IN FULL BEARING. PROVIDE FOR ALL SLOPES OF 1:20 AND LARGER.

g) THE DIAMETER OF HOLES IN SPECIAL, BEVELED AND SQUARE WASHERS SHALL NOT EXCEED 1/16" (1600 MM) MORE THAN THE NOMINAL BOLT DIAMETER.

h) THREAD LUBRICATION SHALL BE JOHNSONS 140 STEEL MAX (JOHNSONS 139 FOR GALVANIZED FASTENERS) OR OTHER ACCEPTED LUBRICANT.

i) BOLT TENSION INDICATING DEVICES SHALL BE DIRECT-TENSION INDICATING DEVICES (DTI) OR TENSION CONTROL FASTENERS (TCF).

a) DIRECT-TENSION INDICATING DEVICES SHALL BE OF DOMESTIC MANUFACTURE, CONTAINING ONLY DOMESTICALLY PRODUCED RAW MATERIALS, CONFORMING TO ASTM F599, IN THE CONTRACT DRAWINGS AS SPECIFIED BY THE ENGINEER.

b) TENSION CONTROL FASTENERS SHALL CONFORM TO THE APPLICABLE PROVISIONS OF ASTM A325 TYPE 1 OR TO ASTM A490 TYPE 1. BOLTS, NUTS AND HARDENED WASHERS SHALL BE BY A MANUFACTURER WHO HAS BEEN DESIGNATED OF A CURRENT ICBO APPROVAL AND WHICH HAS BEEN ACCEPTED.

1) NEITHER A490 TYPE 3 NOR A325 TYPE 2 SHALL BE USED IN THE WORK.

2. DEFORMED ANCHOR BARS SHALL BE ASTM A996 DEFORMED BARS PREPARED FOR STUD WELDING AS MANUFACTURED BY ERICO JONES, OR BY NELSON STUD DIVISION OF TCM, OR OTHER ACCEPTED ANCHOR BAR. PROVIDE 1/2 INCH (12 MM) DIAMETER, 16 INCHES (1600 MM) LONG, UNLESS OTHERWISE GIVEN IN THE DRAWINGS.

3. KILLED SURFACES: COAT WITH BLUE LACQUER 1711 BY VACROFITT PAINT CO., MAGNIFILM BY MAGNUS CHEMICAL CO., OR N-2658 BLUE LACQUER BY U.S. STEEL CORP.

4. DRILLED-IN ANCHORS SHALL BE WEDGE-TYPE. CAPSULE-TYPE SHALL NOT BE PERMITTED. DRILLED-IN ANCHORS DESIGNATED IN THE CONTRACT DRAWINGS AS CARRYING A SPECIFIC TENSILE LOAD SHALL BE TENSILE-TYPE.

a) WEDGE-TYPE: HOLLY PARABOLIT BY HOLLY FASTENER, WEDGE ANCHORS BY JTM RANST/RED HEAD, HEB DINK BOLT BY HILTI, RAIL STUD BY THE RAIL COMPANY, OR OTHER WHERE ACCEPTED.

1) MATERIAL FOR WEDGE-TYPE ANCHORS SHALL CONFORM TO SAE-J429, GRADE 5 OR TO ASTM A325.

b) TENSILE-TYPE: NUT BOLT BY DRILCO DEVICE, LTD., OR OTHER ACCEPTED ANCHOR.

1) MATERIAL FOR TENSILE-TYPE SHALL CONFORM TO ASTM A193 WITH NUTS AND WASHERS AS SPECIFIED HEREIN FOR ASTM A325 BOLTS.

c) GALVANIZING SHALL CONFORM TO ASTM B695, GRADE 50 OR TO ASTM B633.

d) STAINLESS STEEL FOR STUDS AND WASHERS SHALL CONFORM TO A316 GRADE 304 OR GRADE 316 AND TO ASTM F593, GROUP 1 OR GROUP 2, CONDITION OR FOR WEDGE-TYPE ANCHORS. NUTS SHALL BE OF STAINLESS STEEL CONFORMING TO ASTM F394.

5. ANCHOR BOLTS: MAY BE OF UNCOATED STEEL UNLESS OTHERWISE REQUIRED BY THE CONTRACT DRAWINGS. BY BUILDING CODE OR BY GOVERNMENTAL AUTHORITIES HAVING JURISDICTION, UNLESS OTHERWISE PROVIDED IN THE CONTRACT DRAWINGS PROVIDE 3/4 INCH (19 MM) DIAMETER OR LARGER.

a) UNLESS OTHERWISE GIVEN, PROVIDE AS FOLLOWS:

- 1) BOLT MATERIAL CONFORMING TO ASTM A572, GRADE 42.
- 11) TWO HEAVY HEX NUTS AS SPECIFIED FOR ASTM A325.
- 111) 3 X 3 X 3/8 (75X75X10 MM), F1 36 (235 MPa) PLATE WASHER.

b) WHERE DESIGNATED A325, PROVIDE AS FOLLOWS:

- 1) BOLT MATERIAL CONFORMING TO ASTM A325 OR TO ASTM A490.
- 11) TWO HEAVY HEX NUTS AS SPECIFIED FOR ASTM A325.
- 111) 3 X 3 X 1/2 (75X75X12 MM), F1 50 (345 MPa) PLATE WASHER.

16. THREAD LOCKING COMPOUND SHALL BE LOC-TITE 242 OR DRI-LOC 100, AS APPROPRIATE. BY LOC-TITE CORPORATION, PRO-LOCK NUT BY F&B CORPORATION, OR OTHER ACCEPTED COMPOUND.

17. STEEL DECK SUPPORT CHAIRS: PROVIDE ANGLES OF 5/16 INCH (8 MM) MINIMUM THICKNESS AND 3 INCH (75 MM) MINIMUM WIDTH EXCEPT WHERE DIFFERENT SHAPES OR DIMENSIONS ARE ACCEPTED.

18. GRATINGS SHALL BE FAPORTIONED TO RESIST SAFELY THE SUPERIMPOSED LOADS.

a) FOR PEDESTRIAN LOADING PROVIDE GRIP STUPT, GALVANIZED, PROPORTIONED TO CARRY SAFELY A LIVE LOAD OF NOT LESS THAN 100 PSF (5 KPA).

L. FABRICATION

1. FINISHING SHALL BEAM MILLED TO A24 250 OR SMOOTHER, UNLESS ANOTHER FINISHING METHOD IS BOTH DESIGNATED IN SHOP DRAWINGS AND ACCEPTED. FINISHED SURFACES SHALL BE PROTECTED BY A CORROSION INHIBITING SUBSTANCE AS PROVIDED HEREIN. FINISHED CONTACT SURFACES OF BASE PLATES, COLUMN SPICES, WHERE INDICATED "FIT TO BEAR", AND AT OTHER LOCATIONS WHERE INDICATED IN THE CONTRACT DRAWINGS.

2. GAS CUTTING: GAS CUTTING, INCLUDING MISCELLANEOUS CUTS, COPIES, CUTS FOR WELD ACCESS AND THE LIKE, SHALL PROVIDE SMOOTH, UNIFORM, NON-OXIDIZED SURFACES AND SHALL ACHIEVE A 1000 MICRON SURFACE ROUGHNESS OR BETTER AS DEFINED BY THE CONTRACTOR. CUTTING BY HAND-GUIDED TOOLS SHALL BE MACHINE GUIDED; CUTTING BY HAND-GUIDED TOOLS SHALL REQUIRE GRINDING. PROVIDE 1/2 INCH (13 MM) MINIMUM RADIUS BUT AT ALL SURFACES WHERE SHARP CORNERS ARE REQUIRED OR LARGER RADIUS FOR SPECIFIC DETAILS IS SHOWN OR NOTED IN THE CONTRACT DRAWINGS OR SPECIFICALLY REQUIRED BY CONTRACTOR AND ACCEPTED IN SHOP DRAWINGS. GAS CUT SURFACES SHALL BE MADE UNIFORM AND NOTCH-FREE BY CHIPPING, PLANING, WELDING AND GRINDING AS REQUIRED, AND SHALL BE VERIFIED BY CONTRACTOR BY FULL VISUAL INSPECTION; WHERE HAND-HELD CUTTING TOOLS ARE USED, AND WHERE REQUIRED BY AISC SPECIFICATION, CONTRACTOR SHALL PROVIDE 100% INSPECTION BY DIE-PENETRANT OR BY MAGNETIC PARTICLE.

a) GALVANIZED MEMBERS: GAS-CUT SURFACES AT RE-ENTRANT CORNERS SHALL BE GRIND TO BRISTLE METAL AND TESTED BY DIE-PENETRANT OR MAGNETIC PARTICLE TESTING PRIOR TO GALVANIZING AND VERIFIED BY CONTRACTOR BY FULL VISUAL INSPECTION AFTER GALVANIZING.

3. STRAIGHTENING: FABRICATED MATERIALS CONTAINING SHARP KINKS OR BENDS SHALL BE REJECTED. MATERIAL STRAIGHTENED PRIOR TO FABRICATION SHALL BE EXAMINED CAREFULLY FOR SIGNS OF DISTRESS AND FOR OTHER DEFECTS BEFORE BEING PLACED IN FABRICATION. DISTRESSED OR OTHERWISE DEFECTIVE MATERIAL SHALL NOT BE USED IN THE WORK. STRAIGHTENING BY THE USE OF PROPERLY CONTROLLED HEAT WILL BE PERMISSIBLE IF DONE BY PERSONNEL SKILLED IN HEAT STRAIGHTENING AND AT SURFACES AND TECHNIQUES IN ACCORD WITH WRITTEN PROCEDURE DOCUMENTS AND APPLICABLE DETAIL SKETCHES PREPARED BY THE FABRICATOR AND ACCEPTED BY ENGINEER.

4. GRINDING: SHARP CORNERS, PROJECTIONS, AND SIMILAR ROUGH OR SHARP SURFACES OR EDGES SHALL BE BEAD AND SMOOTHED BY GRINDING SO AS TO PROVIDE NOTCH-FREE SURFACES.

5. PREHEAT: WELDING SHALL BE PERFORMED ON MATERIAL PREHEATED TO A TEMPERATURE ABOVE THE DEMPPOINT. PREHEAT FOR WELDING SHALL BE SOAKED PREHEAT AND SHALL BE VERIFIED BY HEAT SENSITIVE CRACKS (TENSILE) OR OTHER ACCEPTED MEANS.

6. WELDING MATERIALS AND PROCESSES SHALL BE SELECTED FROM THOSE NOTED HEREIN AND SHALL CONFORM TO ACCEPTED WELDING PROCEDURE SPECIFICATIONS. WELDING MATERIALS SHALL BE FRESH AND NEW. WELDING ELECTRODES OR FLUX CONTAMINATED BY DELETERIOUS SUBSTANCES OR MOISTURE SHALL NOT BE USED AND SHALL BE REMOVED PROMPTLY FROM THE WORK. LOW HYDROGEN ELECTRODES WHICH CANNOT BE USED PROMPTLY AFTER OPENING OF HERMETICALLY SEALED CONTAINERS SHALL BE STORED IN ELECTRIC HOLDING Ovens AT 250°F (120°C) MINIMUM. ELECTRODES OR FLUX WHICH HAVE BEEN DAMAGED OR CONTAMINATED SHALL BE REMOVED PROMPTLY FROM THE WORK.

7. TACK WELDS: EXERCISE THE SAME DEGREE OF CONTROL IN MAKING TACK WELDS AS REQUIRED FOR STRUCTURAL WELDS. INCLUDING PROTECTION OF PREHEAT AND POSTHEAT APPROPRIATE TO THE BASEMETALS JOINED. TACK WELDS WHICH CRACK SHALL BE CUT OR GRIND AND DAMAGED BASE METAL REPAIRED. REMOVE AND GRIND SMOOTH TACK WELDS NOT INCORPORATED INTO PERMANENT STRUCTURAL WELDS.

8. ARC STRIKES: STRAY ARCING BETWEEN ELECTRODES OR OTHER PORTIONS OF THE WELDING SYSTEM AND BASE METAL LOCATIONS OUTSIDE STRUCTURAL WELDS SHALL BE AVOIDED TO THE MAXIMUM EXTENT PRACTICABLE. IN THOSE LOCATIONS WHERE ARC STRIKES DO OCCUR, THE AFFECTED BASE METAL SHALL BE GRIND SMOOTH, OR OTHERWISE REPAIRED, TO REMOVE THE EFFECTS OF THE ARC STRIKE AND ENSURE CONTINUING SOUNDNESS OF THE BASE METAL.

9. SHOP BOLTING WITH ASTM A325 OR ASTM A490 BOLTS SHALL CONFORM TO APPLICABLE PROVISIONS OF THE AISC SPECIFICATION AND SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS EXCEPT THAT ALL BOLTING PROVISIONS SET FORTH HEREIN SHALL APPLY TO HIGH-STRENGTH SHOP BOLTING.

10. DRAINAGE WELDS: PROVIDE WELDM TUBULAR, BOX AND OTHER MEMBERS ARE SEALED TIGHT AT CONTRACTOR'S OPTION OR IN ACCORD WITH NOTES AND DETAILS INCLUDED IN THE CONTRACT DRAWINGS. CONTRACTOR IS FULLY RESPONSIBLE TO PROVIDE STEELWORK FREE OF ENTRAPPED AIR AT THE COMPLETION OF THE CONTRACT.

WHERE ONE END OF A GALVANIZED TUBE IS SPECIFIED TO BE SEALED, PROVIDE A 1/16 INCH DIAMETER HOLE AT THE OPPOSITE END TO PERMIT PRESSURE RELIEF DURING THE HOT DIP PROCESS. WHERE BOTH ENDS ARE SEALED, WELD ONE END PLATE ON THE TUBE AFTER THE GALVANIZING PROCESS.

TABLE 3-2-1 PREHEAT AND POSTHEAT CONDITIONS FOR WIDE FLANGE SEAMS			
CE (INCH)	FLANGE THICKNESS		
	< 1-1/2 IN (38 MM)	1-1/2 IN TO 2 IN (38 MM TO 51 MM)	2 IN TO 4 IN (51 MM TO 102 MM)
< 0.38		PREHEAT ≥ 350°F	
≤ 0.40		INTERPASS ≥ 125°F	
≤ 0.42	PREHEAT ≥ 125°F	PREHEAT ≥ 350°F	INTERPASS ≥ 125°F
≤ 0.44	INTERPASS ≥ 125°F	PREHEAT ≥ 350°F	INTERPASS ≥ 125°F
≤ 0.46	INTERPASS ≥ 125°F	PREHEAT ≥ 350°F	INTERPASS ≥ 125°F
≥ 0.46		PREHEAT ≥ 350°F	INTERPASS ≥ 125°F

NOTE: 125°F = 52°C, 350°F = 177°C, 600°F = 316°C

15. WELD INSPECTION: CONTRACTOR SHALL PROVIDE FULL SHOP AND FIELD INSPECTION TO ASSURE THAT ALL WELDING CONFORMS TO THE REQUIREMENTS OF CONTRACT DRAWINGS AND SPECIFICATIONS. GOVERNING DOCUMENTS INCLUDE BUT ARE NOT LIMITED TO CONTRACT DOCUMENTS, BUILDING CODE AND AISC/DI.1. ALL INSPECTIONS SHALL ASSURE THAT WELDS ARE IN TENSION, WITH DIRECTION OF STRESS IN MOST CRITICAL DIRECTION (FOR EXAMPLE, TRANSVERSE TO UNDERCUT).

16. RUNOFF AND RUNOFF TABS SHALL BE REMOVED AND THE SURFACE MADE SMOOTH PRIOR TO VISUAL AND NON-DESTRUCTIVE TESTING AND PRIOR TO SHIPPING STEEL TO THE CONSTRUCTION SITE. TABS FOR FIELD WELDS SHALL BE REMOVED AT ALL LOCATIONS WHERE REMOVED OR DIRECTED.

17. CLEAN, PAINT AND GALVANIZE STEEL AS PROVIDED HEREIN. DO NOT PAINT STEEL EXCEPT WHERE PROVIDED SPECIFICALLY HEREIN OR IN THE CONTRACT DRAWINGS.